

**REMARKS**

Claims 16-26 are currently pending in the application. By this amendment claims 24-26 are added for the Examiner's consideration. Support for the added claims can be found at paragraphs [0033] to [0041].

The invention simplifies varactor fabrication and tightens manufacturing tolerances by eliminating one or more etching or layer formation steps. The varactor formation process relies on doping a semiconductor substrate, while eliminating depositing or etching steps. Embodiments of the invention include doping a single substrate to form a lower doped region, a middle doped region, and an upper doped region, i.e.: no additional layer need be added to the top of the substrate. Consequently, embodiments of the invention distinguish over the AAPA because the AAPA requires the addition of an extra layer after doping a lower and middle region and then doping the extra layer to form an upper-doped region.

The AAPA shows a Si substrate 12 having an N<sup>+</sup> subcollector 14 formed by a doping process. On top of the N<sup>+</sup> subcollector 14 is a collector 16 which may be formed by a tail of the N<sup>+</sup> doping process which forms the N<sup>+</sup> subcollector. Also included in the Si substrate 12 is a hyper-abrupt junction layer 24. The hyper-abrupt junction layer 24 is formed by a doping process of the Si substrate 12. After the upper layer of the Si substrate 12 is doped to form the hyper-abrupt junction layer 24, an additional layer is added to the top of the Si substrate 12 to form the LTE layer 26. Accordingly, the structure of the varactor 10 includes a Si substrate 12 having doped regions therein upon which an additional layer, i.e., the LTE layer 26 is formed.

Kajimura shows a layer 6 formed on top of an action layer 5 where an action layer 5 is a hyper-abrupt n-type action layer. Because action layer 5 is an n-type layer, it receives an n-type doping. Because layer 6 is a p<sup>+</sup> type low-resistance layer, it receives a p<sup>+</sup> type doping. Kajimura does not show or suggest any other doping step, and thus there are a total of two doping steps shown in Kajimura.

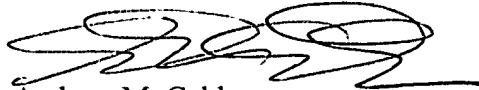
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### CONCLUSION

In view of the foregoing amendments and remarks, Applicants submits that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed. Applicants hereby makes a written conditional petition for extension of time, if required. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 09-0456.

Respectfully submitted,



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